

Amendments to the Claims:

Please cancel claims 1-15, as well as the substitute claim 1, presented in the underlying International Application No. PCT/DE2004/000718 without prejudice, and add new claims 16-33 as shown in the listing of claims.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-15 (canceled)

Claim 16 (new): An apparatus for detecting photons of a light beam emanating from a spatially limited source, the apparatus comprising:

a detection device including a plurality of detectors forming a three-dimensional array including a first semitranslucent EMCCD disposed behind a second semitranslucent EMCCD; and

a light splitting device disposed in a path of rays of the light beam and configured to split the light beam so as to distribute the photons over the detectors for detection.

Claim 17 (new): The apparatus as recited in claim 16 wherein the light beam is a light beam of a fluorescence microscope.

Claim 18 (new): The apparatus as recited in claim 16 wherein the plurality of detectors is configured to detect single photons so as to provide single photon counting.

Claim 19 (new): The apparatus as recited in claim 16 wherein the plurality of detectors includes at least one of an avalanche photodiode, a photomultiplier and an EMCCD.

Claim 20 (new): The apparatus as recited in claim 16 wherein the plurality of detectors forms at least one of a one-dimensional and a two-dimensional array.

Claim 21 (new): The apparatus as recited in claim 16 wherein the light splitting device is configured to split the light beam so as to statistically distribute the photons.

Claim 22 (new): The apparatus as recited in claim 21 wherein the light splitting device is configured to statistically distribute the photons in a defocusing process.

Claim 23 (new): The apparatus as recited in claim 16 wherein the light splitting device includes a cylindrical lens.

Claim 24 (new): The apparatus as recited in claim 16 wherein the light splitting device is configured to split the light beam so as to spectrally distribute the photons.

Claim 25 (new): The apparatus as recited in claim 16 wherein the light splitting device includes a prism.

Claim 26 (new): The apparatus as recited in claim 16 wherein the light splitting device includes at least one of an electrooptical element and an electromechanical scanner.

Claim 27 (new): The apparatus as recited in claim 16 wherein the light splitting device includes a plurality of light splitting components.

Claim 28 (new): The apparatus as recited in claim 16 further comprising an electronic counter disposed in a vicinity of the detection device and configured to count photons.

Claim 29 (new): The apparatus as recited in claim 16 wherein the electronic counter is

disposed on a chip of an EMCCD.

Claim 30 (new): The apparatus as recited in claim 16 further comprising an FPGA programmed with a counting logic for counting photons.

Claim 31 (new): The apparatus as recited in claim 28 further comprising an adder connected upstream or downstream of the electronic counter.

Claim 32 (new): The apparatus as recited in claim 30 further comprising an adder connected upstream or downstream of the FPGA.

Claim 33 (new): The apparatus as recited in claim 16 further comprising associated electronics having a monolithic design.